

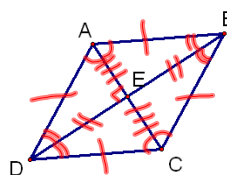
8-5 Rhombi and Squares

Rectangles, Rhombi, and Squares are all parallelograms

Rhombus--quadrilateral with 4 congruent sides



Square--quadrilateral with 4 right angles and 4 congruent sides



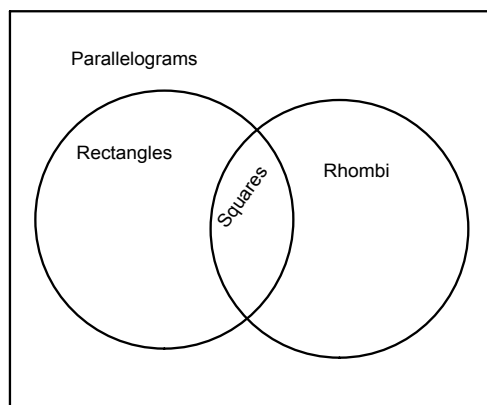
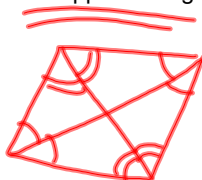
Rhombus ABCD

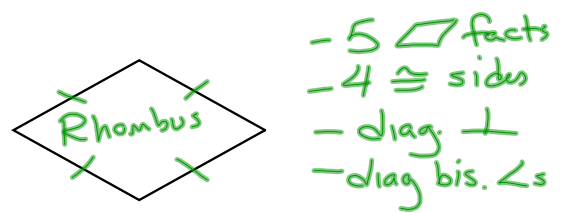
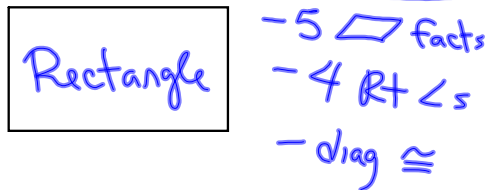
Theorem 8.15--The diagonals of a rhombus are perpendicular



Theorem 8.16--If the diagonals of a parallelogram are perpendicular, then it is a rhombus.

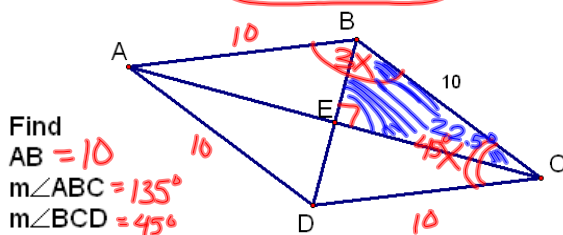
Theorem 8.17--Each diagonal of a rhombus bisects a pair of opposite angles





Rhombus ABCD

$$m\angle ABC = 3m\angle BCD$$



Find

$$AB = 10$$

$$m\angle ABC = 135^\circ$$

$$m\angle BCD = 45^\circ$$

$$m\angle BCE = 22.5^\circ$$

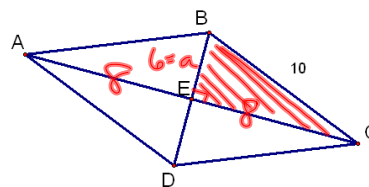
$$* \text{Find BE} \approx 3.8$$

$$\sin 22.5 = \frac{BE}{10}$$

$$\begin{aligned} x + 3x &= 180 \\ 4x &= 180 \\ x &= 45^\circ \end{aligned}$$

Rhombus ABCD

$$AC = 16$$



Find BD.

$$12$$

$$\begin{aligned} 10^2 &= 8^2 + a^2 \\ 36 &= a^2 \\ 6 &= a \end{aligned}$$

Is $\square ABCD$ a rectangle, rhombus, or a square. List all that apply.

1. A(-7, 3) B(-2, 3) C(1, 7) D(-4, 7)

Check diagonals
 • $\cong \rightarrow$ Rectangle
 • $\perp \rightarrow$ Rhombus

$\overline{AC} \quad m = \frac{7-3}{1-(-7)} = \frac{4}{8} = \frac{1}{2}$
 $\overline{BD} \quad m = \frac{7-3}{-4-(-2)} = \frac{4}{-2} = -2$

\perp (opposite reciprocals)
 Rhombus

$AC = \sqrt{8^2 + 4^2} = \sqrt{80}$
 $BD = \sqrt{(-2)^2 + (4)^2} = \sqrt{20}$

\neq not rect
 not squ

Is $\square ABCD$ a rectangle, rhombus, or a square. List all that apply.

2. A(-2, -1) B(-4, 3) C(1, 5) D(3, 1)

$\overline{AC} \quad m = \frac{5-(-1)}{1-(-2)} = \frac{6}{3} = 2$
 $\overline{BD} \quad m = \frac{1-3}{3-(-4)} = \frac{-2}{7}$

$AC = \sqrt{3^2 + 6^2} = \sqrt{45}$
 $BD = \sqrt{(-2)^2 + 7^2} = \sqrt{53}$

\neq

p434-435
12-20, 26-31